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**From Technology to Capability**  
**Will Our Acquisition and Combat Development**  
**Leaders Select the Right Systems?**

by

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Technology, whether initially developed for commercial or military purposes, is the fuel of the ongoing advancements in military affairs. New technological capabilities, along with concepts for their implementation, support development of dramatically new doctrine: the engine that will revolutionize the basic force structure of our military. It takes competent, innovative, and enlightened leadership to mold the most effective technologies into superior systems. But will our future acquisition and combat development leaders make the right choices from the cauldron of emerging technologies? Will they see in a given configuration merely the sum of individual elements of combat power? Or will they envision capabilities achievable through the synergistic effects of combining multiple elements? They will be bombarded with a constant continuum of advanced technologies that must be thoroughly exploited for military use. Their rate of review- must be much faster and much less expensive than we currently are capable of achieving. They must know how to work in this new era but today's education process and working environment will not support the development tempo. The dramatic, ever-increasing speed of technological evolution requires a new order of education and career progression systems for acquisition and combat development officers.

Today's leaders are tackling the near-term challenges by bringing new technology into the Army in a forward-looking manner. One only needs to look at the accomplishments of Louisiana Maneuvers and the dynamic evolution and planned experimentation of the Force XXI concepts as proof<sup>1</sup>. But the world is changing at an ever increasing rate. In only a few years today's majors and captains will lead development and application of new military concepts and technology well into the next century. They will use Force XXI baseline capabilities only as a starting point from which to achieve innovations beyond our comprehension today - into an age that some call the revolution in military affairs. We need acquisition and combat development leaders who are capable of selecting the most cost

effective capabilities - the golden nuggets that will propel our Army well into the 21st century. We must shape the culture and environment of the innovators through equally innovative education and career management initiatives. But this is not an easy task.

Unfortunately, organizations with strong cultures often tend to encourage innovation more in word than in deed. Almost all societies discourage innovation. Such reluctance is compounded in bureaucratic organizations, which maintain longstanding structures that promote the status quo. Over 400 years ago Machiavelli observed:

"There is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer has enemies in all those who profit by the old order, and only lukewarm defenders in all those who would profit by the new order...who do not truly believe in anything new until they have had actual experience of it"<sup>2</sup>.

Machiavelli's skepticism of bureaucracies is as warranted now as it ever was. Our uniformed military does not introduce mid-level managers into the ranks from outside sources where an innovator could influence the culture as new transfers do within commercial enterprises. Rather, the military acquires its future leaders during their formative years. Throughout their careers, they are exposed to the hierarchy, traditionalism, and doctrine that worked well in the past. They prosper and then promote the culture as senior leaders. It is, therefore, difficult for them to accept anything other than incremental change.

As a young captain, Dwight Eisenhower experienced this culture when he was threatened with a court martial by a short-sighted Chief of Infantry in the early 1920's because Ike was suggesting radically new missions for the tank - using tactics which would displace infantry units<sup>3</sup>. Less than two decades later and using similar tactics, Hitler's Panzers defeated France in a mere six weeks. Because of resistance it was only late in the planning stages for Desert Storm that the Special Operations Forces were assigned novel targeting missions behind enemy lines. The Special Forces prevented hundreds if not thousands of coalition force casualties through such missions using new innovative systems. The culture that accepts the status quo as "good enough" will not survive in the future. Innovations are occurring so swiftly that what's good enough, now, may be an inferior force within ten to twenty years.

A small and agile Information Age force in the 21st century will be able to inflict major damage and likely destroy a modern Industrial Age army. Small military units will be able to inflict damage and destruction with unprecedented efficiency. An Information Age company size joint force unit with an optimum mix of air, sea, and ground personnel and weapons will have military

power equivalent to that of a small WW II era division. The precision and accuracy of the new weapon systems coupled with the ability to know exactly where the enemy is at all times will make virtually every shot count. Desert Storm, we have seen, was a proving ground for many first generation systems where they performed exceptionally well in their infancy. Our military has the capability of achieving quantum leaps in operational tempo but only if we select the most effective systems and operational concepts.

General Gordon R Sullivan, Chief of Staff of the Army, and other senior military leaders recognize that emerging technologies will significantly enhance all aspects of military capabilities in both war and peace. Our senior leaders are leading development of doctrine, the engine of change, with supporting organizational and personnel structures to harness this new technology as we enter the 21st century. The Battle Labs, established in 1992, experiment with changing methods of warfare incorporating new technical capabilities emerging from both commercial and government sources. Each of the five Training and Doctrine Command battle labs with the Army Materiel Command laboratories play a part. The battle labs mirror the combined arms and services organizations affected by changes in the battlefield dynamics<sup>4</sup>. AMC's commodity laboratories compliments the process by technological inputs. Louisiana Maneuvers and the follow-on Force XXI are our Army's forums for experimenting with new concepts that incorporate emerging Information Age technologies. They hold a justified urgent priority for developing new concepts which effectively utilize the newly acquired capabilities. This thrust has been led by combat developers and Acquisition Corps leaders. Today, the organization and process are now in place for experimenting with systems.

But how do we ensure that future leaders will be capable of exploiting the best and most appropriate technologies? How can we assure ourselves that we have done our best to prepare them to make the best selections from seemingly similar capabilities generated from unrelated approaches? Our future acquisition and combat development leaders must be successful in an environment characterized by volatility, uncertainty, complexity, and ambiguity. An educational program that develops one's ability to work in a fluid environment is a critical step in ensuring that the right people are selected for senior leadership assignments. We must also ensure that the most successful acquisition leaders receive recognition and rewards based upon innovation and risk-taking, rather than by implementing low-risk alternatives.

Much of the training will occur within the acquisition organization through day-to-day concepts development and design of hardware and systems. But on-the job training, as we know it now, is not enough. We must expand leadership training and

education systems beyond the walls of our current school system and the immediate work area. The new educational order must emphasize how to think. Every acquisition team member must be capable of envisioning both the potential utility of the new technology and the demands it will make in maintenance, sustainment, transportability and other contextual variables. And that's not all. In addition to technology choices, changes in the National Military Strategy, resources, policies, threats, and political circumstances must be considered by our future developers. On a daily basis our leaders must make decisions based upon these external parameters. Training scenarios must realistically portray the future as an unknown, forcing students to extend themselves well into this fog of future technologies.

Interactive acquisition and combat simulations will provide the centerpiece of the new hands-on training. With the advent of Information Age technologies this becomes achievable. The educational process will incorporate a "Louisiana Maneuvers" team approach, where major new weapon systems will be designed and tested in the virtual environment. The student teams will use this capability to swiftly develop and experiment with both designs and concepts. They will exercise multiple combinations of technologies, as well as evaluate intrinsic dependencies caused by seemingly unrelated but nonetheless important peripheral factors. Then the leader and the program staff select alternatives within a simulated environment they will gain a realistic perception for the successes and failures. Small variations of new technological capabilities could be tested on a synthetic theater battlefield swiftly. System performance, concept validation, logistics efficiencies, and command and control issues would be easily reviewed, and more refined selections developed through interactive simulation programs as they are re-run - a capability only achievable within the virtual environment. The process will be conducted on networked simulations with team players located at Army research, development, and engineering centers, battle labs, and professional training centers along with counterpart sister service organizations.

Just as in Louisiana Maneuvers virtual battlefield experiments, this process will incorporate a mix of progressive and iterative simulations using realistic constructive and virtual scenarios. The Training and Doctrine Command (TRADOC) simulation internet will tie the network together through the Defense Simulation Internet nodes at the Defense System Management College, senior service schools, and the services' command and staff colleges. This educational process, geared for the warfighter, is now unfolding in the Command and General Staff College Mobile Strike Force exercise. Although the subject area is quite different, the educational process is similar. The student development effort will culminate with inclusion of the team selected technically advanced systems in a simulation

scenario conducted with soldiers - including sailors, airmen and marines as appropriate - and units in a tactically competitive synthetic environments. Soldiers will be the final evaluators of the student developed weapon system design and the employment concept within the virtual environment. Such user feed-back will help the student acquisition team members gain a better understanding of how well they thought through the process.

Members of other services will be key players. The training will focus on joint operations and incorporate the contributions of the sister services where their warfighters and developers would play service roles. They will bring their own variables into this simulated environment with their own needs for training being met on a virtual joint service battlefield. The sister services in turn may see complimentary technology development possibilities through the simulated training exercises and, as development partners, evolve mutually beneficial hardware and joint warfighting concepts. Great strides will be made jointly, possibly in the principal missions of the respective services, but more likely within shared or similar processes such as logistics or communications functions. The leader and his acquisition team will become better able to make knowledgeable decisions within the highly volatile development environment<sup>5</sup>.

In addition to a strengthened education process we must also enhance our current environment to foster higher levels of innovation and encourage vigorous pursuit of problem solving methods based on critical thinking. Conventional military wisdom will be only one avenue toward the desired solution. Quite likely, it will be the unconventional wisdom that will bring about the most dramatic successes. Chance takers and challengers of conventional principals and tenants are the type of leaders who may arrive at the best solutions whether or not their ideas are culturally acceptable. In the past these skeptics of conventional wisdom have generally been considered as mavericks. Radically new thinking did not generally solve problems requiring incremental advances and their insight may have not been considered. In this environment the innovators either changed their ways early in their careers or they soon found themselves outside the military. These soldiers may not have the warfighter ethos but the Army cannot afford to lose their expertise in this highly volatile environment. They may not think on the same plane as those responsible for immediate actions on the battlefield, but they form the nucleus of innovation. They must be protected and allowed to achieve success, for they will bring the future to the Army.

True, the Acquisition Corps career progression already rewards innovation within today's culture but in the future environment this will not be sufficient. We must go beyond the present personnel policies of the Acquisition Corps and incorporate a career and promotion system which rewards successful risk-taking accomplishments. The system must support

the innovator's career by rewarding their ability to effect innovation.

Military organizations are disciplined hierarchical bureaucracies. Power is won through influence over who is promoted to positions of senior command. Control over the promotion of officers is the source of power in the military ... The organizational struggle that leads to innovation may thus require the creation of a new promotion pathway to the senior ranks so that young officers learning and practicing the new way of war can rise to the top<sup>6</sup>.

Now more than ever before, in the career development of acquisition and combat development personnel, emphasis needs to be placed on the ability to innovate. A focused performance evaluation system must ensure that officers who have demonstrated successful innovations have a stable and achievable career path as we proceed through Force XXI and further into the revolution in military affairs.

#### ENDNOTES

1. Morris Boyd, BG, and Michael Woodgerd, (Force XXI Operations, "Military Review, 74, November 1994): 17-28.

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3. Dwight D. Eisenhower, At Ease: Stones I tell to Friends (New York: Doubleday, 1967), p. 173.

4. U.S. Army Training and Doctrine Command, Director for Battle Lab Integration and Technology, Training Battle Labs ... Maintaining the Edge, (Fort Monroe, VA: Government Printing Office, 1994), pp. 1-15.

5. Department of Defense, Deputy Director for Technical Operations, Force Structure, Resources and Assessment Directorate, J-8, Joint Modeling and Simulation Evolutionary Overview, (Washington, D.C.: Government Printing Office, 1994), pp. 7-15.

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